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It is hoped that the exploring party can be landed at some point on or near the shore of Lady Franklin Bay in time for the *Gulnare* to return home this season. The *Gulnare* is being fitted up for ice navigation under the superintendence of Capt. Chester, who was with Hall in the *Polaris*. A house of wood, double boarded, 21 x 68 feet, modeled after those used by the Hudson's Bay Company, is being constructed for the men to winter in on the shores of Discovery harbor. A steam launch will probably form part of the expedition. The purposes and intentions of this new attempt at Polar discovery are given in the report of the House Committee as follows:

"In making this report the committee respectfully state and report that the object of the bill, as is shown by its terms, is to authorize a temporary station to be selected within the Arctic circle, for the purpose of making scientific discoveries, explorations, and observations, obtaining all possible facts and knowledge in relation to the magnetic currents of the earth, the influence of ice-floes therefrom upon the winds and seasons, and upon the currents of the ocean, as well as other matters incidental thereto, developing and discovering at the same time other and new whale-fisheries, now so material in many respects to this country. It is, again, the object of this bill that this expedition, having such scientific observations in view, shall be regularly made for a series of years, under such restrictions of military discipline as will insure regularity and accuracy, and give the fullest possible return for the necessary expenditure; and, again, in view of the fact that either the governments directly, or scientific corps under their authority, of Germany, Holland, Norway, Sweden, Austria, Denmark, and Russia, have concurrently agreed to establish similar stations, with like object, during the year 1880, it is believed that the interests and policy of our people concur in demanding that the United States should coöperate in the grand efforts to be thus made in the solution of the mysteries and secrets of the North Polar seas, upon which, in the opinion of scientists, depends so much that affects the health and wealth of the human race."

MICROSCOPY.[1]

ADULTERATIONS OF FOOD.—Adulterations or impurities of food may be divided into three classes. First, deleterious adulterations; these are such as are directly injurious to health, such as red lead in cayenne pepper, chromate of lead in mustard, or water in milk. The second class, and by far the largest, is what may be called fraudulent adulterations. These injure the pocket rather than the health. This class does not properly come under the notice of the health officer, but is a fraud upon the general public, which should be taken notice of by mercantile associations. This class may be illustrated by such articles as flour in mustard, chicory in coffee and terra alba in cream of tartar. The third class is what may be called accidental. In many instances of this class, it is the duty of the health officer to interfere and confiscate the goods, but the simple deprivation of the articles is generally sufficient punishment. In other cases, in this class, the presence of the impurity arises from methods of manufacture, and if it does not exceed a certain limited amount it may be neglected, and is generally neglected in trade. For instance, cream of tartar generally contains tartrate of calcium; if this does not exceed six or seven per cent. the article passes as pure. If it runs much higher the article is rejected or passes as a low grade with a reduction in price. Belonging to the same class is the small amount of sand oftentimes found in Cuban sugars, and in general all the impurities in our every-day food which are present, not from design, but from some imperfection in the process of manufacture.

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[1] This department is edited by Dr. R. H. WARD, Troy, N. Y.

The first operation in our search for adulteration is to make ourselves thoroughly acquainted with the genuine article, and in order to make ourselves acquainted it is not sufficient to merely read the accounts we may find in the books, but we must take the articles to our laboratories and submit them to every test that we can devise. Perhaps the most difficult branch of adulteration that the chemist has to deal with is the sophistication of ground articles. So long as the article is in its natural state but little trouble is experienced; we can readily detect any changes made in it, but when ground we have no resource except the microscope or chemical tests. Many substances which contain starch grains can be readily recognized by the microscope. Flour in mustard at once shows. The various arrowroots are readily distinguished by this means. A few weeks ago I had occasion to examine flour that was suspected of adulteration. Washing with water served to show that one portion was much heavier than the remainder. Microscopic tests at once showed that this heavier portion was rice flour. In this case the usual order of adulteration was reversed, and a more expensive article was added to a cheaper one in order to raise the grade of the whole. Much has been said and written in regard to the adulteration of coffee, but so far as I know no one has yet found in the coffee any article more injurious than the coffee itself. Chicory may be readily distinguished from coffee by the fact that when the ground article is thrown into water, if chicory, peas, rye or Indian corn are present, they rapidly sink to the bottom, while the coffee floats. The adulterations also quickly impart to cold water a brown color, while coffee colors it but slowly. Cream of tartar is, perhaps, the substance next on the list at present which gives us the most trouble. The common adulterations of this article are rice flour, which is easily detected by the microscope and by turning blue when treated with tincture of iodine. Terra alba or gypsum, which is but sparingly soluble in hot water, but which may be dissolved with muriatic acid; when this is present the solution gives a precipitate with chloride of barium. It is also readily recognized by the microscope when polarized light is used. Tartrate of calcium—this is almost insoluble in boiling water—is soluble easily in hydrochloric acid, and gives a precipitate with ammonia and oxalate of ammonia. The quantity of this must exceed seven or eight per cent. before it can be reckoned as an adulterant. Milk is another subject about which the controversy seems to be needless. The list of adulterations found in the books is a long one, but when thoroughly investigated, it seems to narrow down to about two or three. Water is added in considerable quantities, a little burnt sugar is then added to bring up the color. One or two other substances are sometimes classed as adulterants, the use of which can hardly be condemned. In hot weather many of the milkmen add a little baking powder or bicarbonate of soda to the milk, or a little salt; both these substances tend to prevent the milk becoming sour and coagulating. A trace of chalk is also sometimes used for the same purpose. The fraud most extensively practiced in this vicinity at the present time is the sale of skimmed for whole milk. This fraud can easily be detected by the microscope. Milk that has been skimmed is comparatively free from large fat globules. Sugar as sold here is perhaps as pure as sold at any place in the world. Candy, however, is like all manufactured articles, to be looked upon with suspicion. The flavoring matters are rarely what they purport to be, and in some cases are violent poisons. At the present time the article is made largely of glucose, which is manufactured from corn starch. I see no objection to the use of this, provided it is well made and purified. In the examination of meat the inspector has to rely largely on his senses and his familiarity with the genuine article. The microscope comes in play here to detect certain diseased conditions, and to show encysted parasites, such as *Trichina spiralis*.

Avoid hasty conclusions about adulteration. Persons often take a look through their microscopes at articles of food and rush into print their discoveries, when a few hours' patient investigation of genuine articles about which there could be no doubt, will serve to show them that they were mistaken in their suppositions. Young students fresh from college are apt to find things very much worse than those who have studied the subject for years. But I would not for this reason discourage a full investigation of the subject. The more thoroughly we become acquainted with it, the better able we will be to detect and secure the punishment of fraud where it does occur.—*Read before the Boston Microscopical Society, by S. P. Sharples, State Assayer of Massachusetts.*

A NEW "GROWING SLIDE" FOR MINUTE ORGANISMS.—Mr. Julien Deby, vice-president of the Belgian Microscopical Society, submitted to the Queckett Club a description of a newly contrived growing slide which is easily made, and which answers its purpose remarkably well. A glass ring is cemented to a 3 × 1 slip, forming a cell one-eighth of an inch deep and three-quarters of an inch in diameter, as if for mounting an object. A small hole is bored through the slip inside of this cell, and near its edge. The objects (as Bacteria, &c.) are placed in a very minute drop of water upon a thin cover-glass which is then inverted upon the cell and attached to its ring by a little lard, the drop with its objects being within the cell but touching only the cover-glass. Another 3 × 1 slip is then placed below the perforated one and attached to it by india rubber bands passed around the ends. One end of the whole combination is then placed in a little water which spreads between the slips by capillary attraction, and by evaporation passes through the hole into the cell, and prevents the drop of water at the top of the cell from drying up. A small fraction of a drop of water may thus be maintained without serious loss for weeks together, the objects it contains being meanwhile in a most favorable position for microscopical study. Mr. T. C. White reminded the members that it was easy to drill the hole through the glass slip by using a steel drill ground to a three-sided point and well hardened by heating and then dipping in turpentine. The hole should be bored half way through from one side, and then from the other, and then cleared out with a small file.

COLLECTING AND MOUNTING SPIDERS' WEBS.—In an interesting paper on this subject read before the Queckett Club, Mr. Geo. Hind states "that he found it unsatisfactory to take the web directly upon the glass slide, it being difficult to secure the desired portion of the web or to free it from the moisture that is present. He prefers to take pieces of wire about twelve inches long, bent into rectangular frames and gummed to secure adhesion of the web. This frame is carefully brought up against the selected portion of the web, which adheres, and the surrounding portion of web is cut away with a pair of scissors. The frame with its adherent web is then placed in a racked box until the web and any insects it may contain are perfectly dry. When ready for mounting, a thin paper cell is fastened to a glass slip, and its upper surface slightly gummed and brought in contact with the web. The surrounding web is cut away with scissors, another thin paper cell is placed above the first, the web being thus left stretched between them, and a cover-glass affixed in the usual way. In this manner may be obtained many small insects that are with difficulty found in any other way. Finding that several spiders that were kept in confinement in order to obtain good threads for mounting, would not at first spin threads, and being unwilling to wait for them to commence, the author occasionally shook the spider to make it spin stray threads, and in so doing discovered the reason why the web is plain in some parts and beaded in others, the radial threads being continuous while those which form the concentric circles are beautifully beaded. "When emitted by the spider, the web is in a very viscid state, and I noticed that when the whole weight of the spider was upon the web, and the thread was fastened off quickly, it was not beaded; but when by some chance the spider had slightly relaxed the tension before fastening it off, I observed a slight quiver pass through the thread, and upon examining it with a magnifier, I found that it was beaded from end to end.

WOOD-FIBRES FOR PAPER-MAKING.—Mr. Galloway C. Morris has contributed to the Postal Club a special box of wood fibres prepared in a form suitable for paper pulp. They were prepared by boiling under pressure in caustic alkali in order to destroy everything but the cellulose, and the peculiar wood fibres of the plants selected are completely isolated and well shown. Not only do the preparations show soft woods such as poplar, pine and buckwheat, but also such harder woods as hickory, rosewood and ebony.

CLEANING COVER-GLASSES.—Dr. R. U. Piper, of Chicago, has invented a very simple method of cleaning cover-glasses without breaking them. Upon a glass plate 2 × 3 inches are cemented, in the form of a V, two thin strips of glass. A cover-glass may be laid upon the glass plate inside of the V and cleaned by rubbing freely, being held in position from slipping by the sides of the V.

SPODUMENE.—An excellent paper on this subject, reprinted from the Annals of the New York Academy of Sciences, by Alexis A. Julien, contains interesting discussions of the microscopical characteristics of this mineral and its alterations. They can be satisfactorily studied only in connection with the accompanying plate.

THE MICROSCOPICAL APPEARANCES OF THE VALVES OF DIATOMS.—In a paper on this subject, reprinted from the Annals of the Belgian Microscopical Society, Mr. Julien Deby, vice-president of the society, gives a very interesting study, accompanied by diagrammatic illustrations, of the proper interpretation, in respect to their physical structure, of the microscopical appearances of some of the more puzzling species of diatoms.

THE AMERICAN JOURNAL OF MICROSCOPY. — This monthly, whose publication was temporarily delayed during a considerable portion of last year, has now been brought up to date, and the current numbers are being issued regularly and promptly. Last year's numbers, Vol. IV, have been issued as a bound volume, and constitute, at a slight cost, a book full of interesting glimpses of the daily progress of this branch of science.